Play4fit: Enhancing Users' Engagement With Smartphone Health And Fitness Application Using Gamification Concept.

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Abstract: This paper elaborates the design, development and evaluation of health and fitness smartphone app, Play4fit. The Play4fit app was developed using systematic approach called Mobile application Development lifecycle (MADLC). This study explores the use of gamification concept in engaging the users whilst using the smartphone app. Game experience questionnaire (GEQ) was used to measure participants' engagement with the Play4Fit app. A study in the wild was conducted with a total of 30 participants and they were assessed using seven components of GEQ, competence, sensory and imaginative immersion, flow, tension, challenge, negative affect and positive effect. Mean scores obtained in this study shows that only two components, competence (M=2.60, SD=0.62), sensory and imaginative immersion (M=2.8, SD=0.71) have the higher mean, above the median value. Results of this study suggest that the gamification app for health ad fitness, Play4Fit have an impact on users' engagement particularly sensory and imaginative immersion.

Index Terms: Smartphone app, health, fitness, Gamification, engagement.

1. INTRODUCTION

Physical exercise has been associated with a better mental and physical health. Researchers suggested that it promote a significant impact on physical and mental health [1]. Unfortunately, there are various reasons given by people why they do not engage with physical exercise such as lack of time, occupied with other work, no motivation and [2]. The prevalence of unhealthy behavior amongst teenagers have been identified such as extreme diet, binge drinking, spending significant amount of time watching television or paying games on computer or mobile devices and many others. These behaviors can lead to chronic diseases which is a major killer [3]. The overweight and obesity have become a major issue in the past decades [4] and mainly due to unhealty eating high fat and sugar food contents but did not burn off enough calories through physical activities [5]. Nowadays, people spend significant amount of their time with television, computers, smartphone and other types of technologies. Teenagers spent an average of nearly two hours online and nearly three hours in front of television [6]. In 2019, time spent on smartphone increase significantly to 2 hours and 55 minutes [7]. The importance of regular exercise is important to maintain healthy life and to have both preventive and healing effects for many disease [8]. Wang and Liu posited that physical activity helps in improvements of emotions, social psychology and cognitive skills [9]. Furthermore, it improves health related quality of life amongst postmenopausal women [10]. Physical activities also have a significant impact on children. A study on the enjoyment of school based physical activity programme shows that it decreases the risk of cardiovascular, metabolic and obesity while increasing their bone health. They highlighted that the enjoyment during school based physical activities promotion in children and supported by behavioral theory such as self-determination theory. Research has shown that technology has an impact on the people lifestyles and various technologies have been used to promote health initiative [11]. For example, computer technologies, internet, smartphone, CD-ROM amongst other. Previous studies show that mobile technologies are able to provide an individual level support for health care consumer ([12], [13]) and subsequently deliver health behavior interventions [14]. A study by de Jongh et al., shows that the communication between patients and healthcare providers plays a vital role in monitor disease and education [15]. The use of mobile related software applications in health and fitness are increasing significantly [16]. It was used to monitor and guide users' health [17], boost users' behavior towards physical activity [18]. Recently, wearable technology for health and fitness has become the fastest growing smart devices in the market [19]. Wearables such as Fitbit Flex, Fitbit Charge HR, Garmin vivo-active and apple watch plays an important role in health and fitness improvement [20]. A gamification apps on the smartphone has been on the rise in which many users spend their time for digital games and other activities [21]. Gamification apps could be used to motivate people to exercise regularly by providing an interactive feature similar to other types of digital games. Ferguson highlights the gamification' potential in health-related aspect, particularly in chronic diseases prevention [22]. In addition, it has a huge impact on availability, cost and effectiveness in both remedial and preventative healthcare. Thus, this study aims to explore the impact of gamification health app on the users' engagement by designing a Play4Fit app to motivate the users in engaging in physical activities.

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2 MOTIVATION AND RATIONALE

Research has shown that the physical activity has a great impact on people mental health [23] and has a potential to prevent against chronic diseases such as metabolic syndrome, obesity, coronary heart disease, stroke, congestive heart failure, cancers amongst others ([24], [25], [26]).

Gamification plays a significant role in enhancing users' motivation and awareness about their physical activities and progress [27]. The participants' motivations in their study significantly improved with the gamification concept. The user engagement with the fitness application can be increased if the fun elements is implemented to attract users' attention.